Novel Gene Sequence Analysis
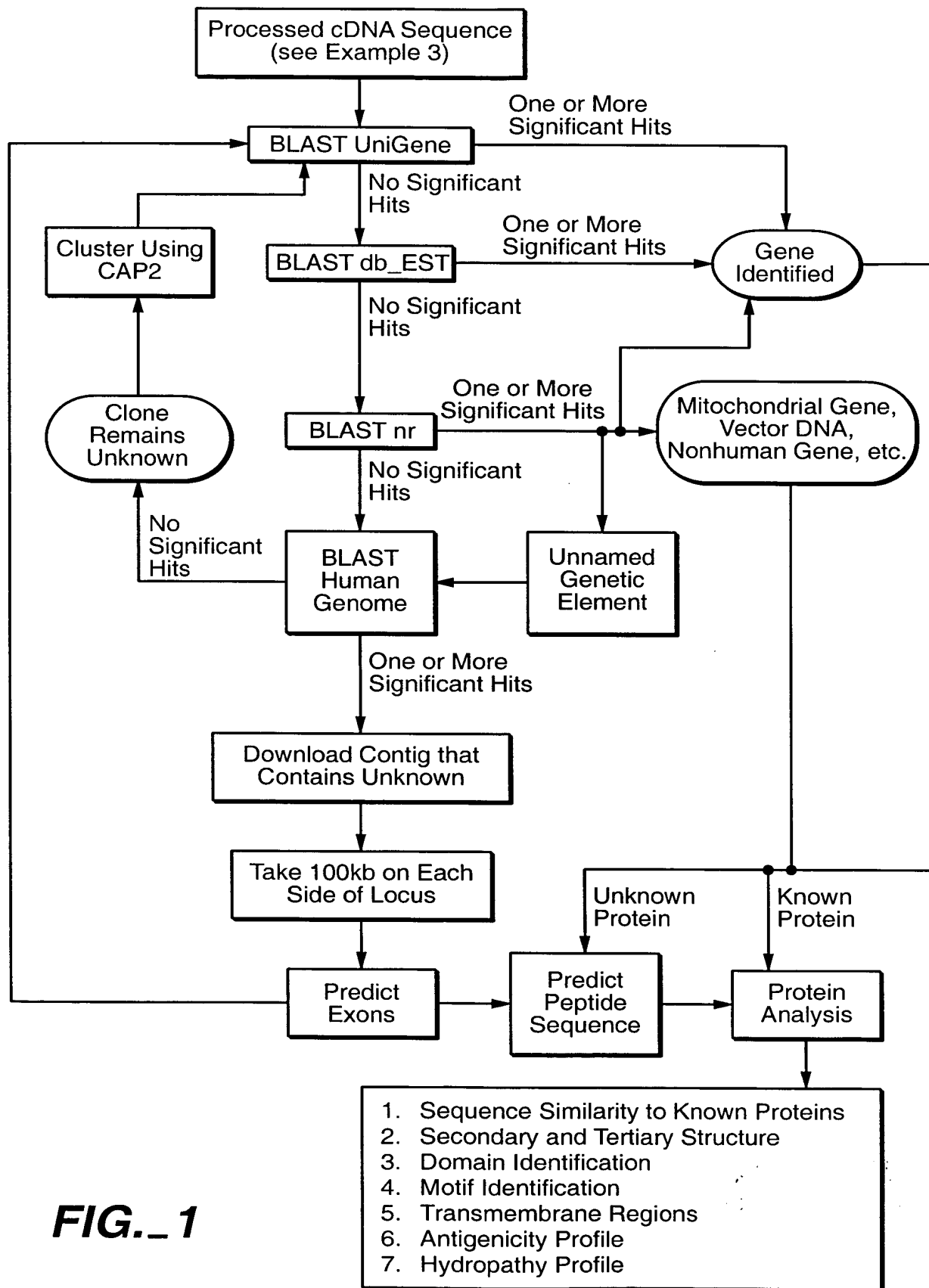

FIG._1

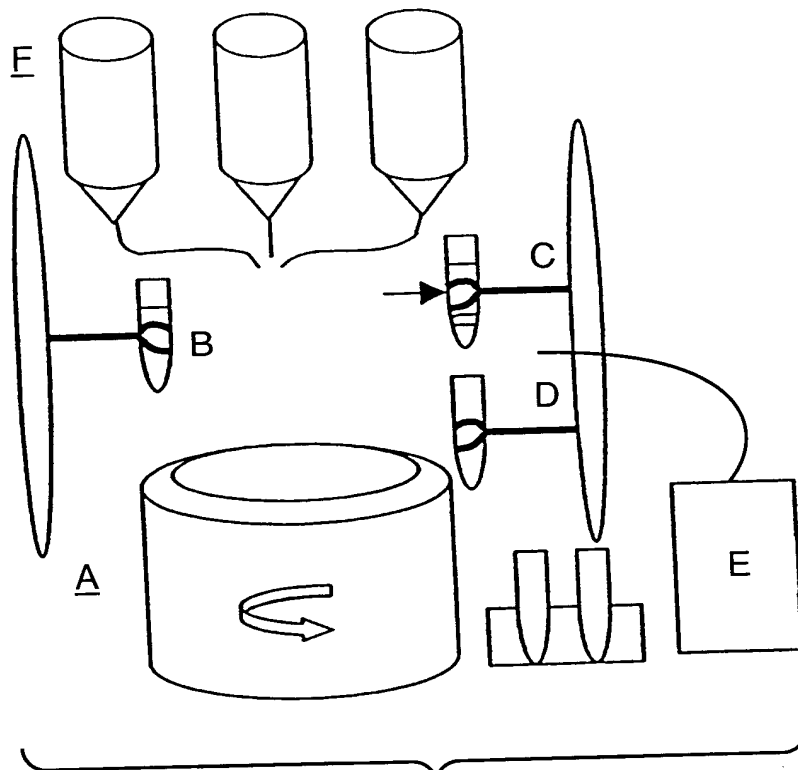## Automated Mononuclear Cell RNA Isolation Device

FIG._2

Kits for Discovery of, or Application of Diagnostic Gene Sets

A. Contents of kit for discovery of diagnostic gene sets

1. Sterile, endotoxin and RNAse free blood collection tubes (>10cc capacity)
2. Alcohol swabs, tourniquet, 18g needle and syringe (>10cc capacity)
3. Erythrocyte lysis buffer
4. Leukocyte lysis buffer
5. Substrates for labeling of RNA (may vary for various expression profiling techniques)

> For fluorescence cDNA microarray expression profiling:
>
> Reverse transcriptase and 10x RT buffer
>
> Poly-dT primer
>
> DTT
>
> Deoxynucleotides 100mM each
>
> RNAse inhibitor
>
> Cy3 and Cy5 labeled deoxynucleotides

6. cDNA microarrays containing candidate gene libraries
7. Cover slips for slides
8. hybridization chambers
9. Software package for identification of diagnostic gene set from data

> Contains statistical methods.
> Allows alteration in desired sensitivity and specificity of gene set.
> Software facilitates access to and data analysis by centrally located database server.

10. Password and account number to access central database server.
11. Kit User Manual

B. Contents of kit for application of diagnostic gene sets

1. Sterile, endotoxin and RNAse free blood collection tubes (>10cc capacity)
2. Alcohol swabs, tourniquet, 18g needle and syringe (>10cc capacity)
3. Erythrocyte lysis buffer
4. Leukocyte lysis buffer
5. Substrates for labeling of RNA (may vary for various expression profiling techniques)

> For fluorescence cDNA microarray expression profiling:
>
> Reverse transcriptase and 10x RT buffer
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> Poly-dT primer
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>
> Deoxynucleotides 100mM each
>
> RNAse inhibitor
>
> Cy3 and Cy5 labeled deoxynucleotides

6. cDNA microarrays containing diagnostic gene sets
7. cover slips for slides
8. hybridization chambers
9. Software package for identification of diagnostic gene set from data

> Contains statistical methods.
> Allows alteration in desired sensitivity and specificity of gene set.
> Software facilitates access to and data analysis by centrally located database server

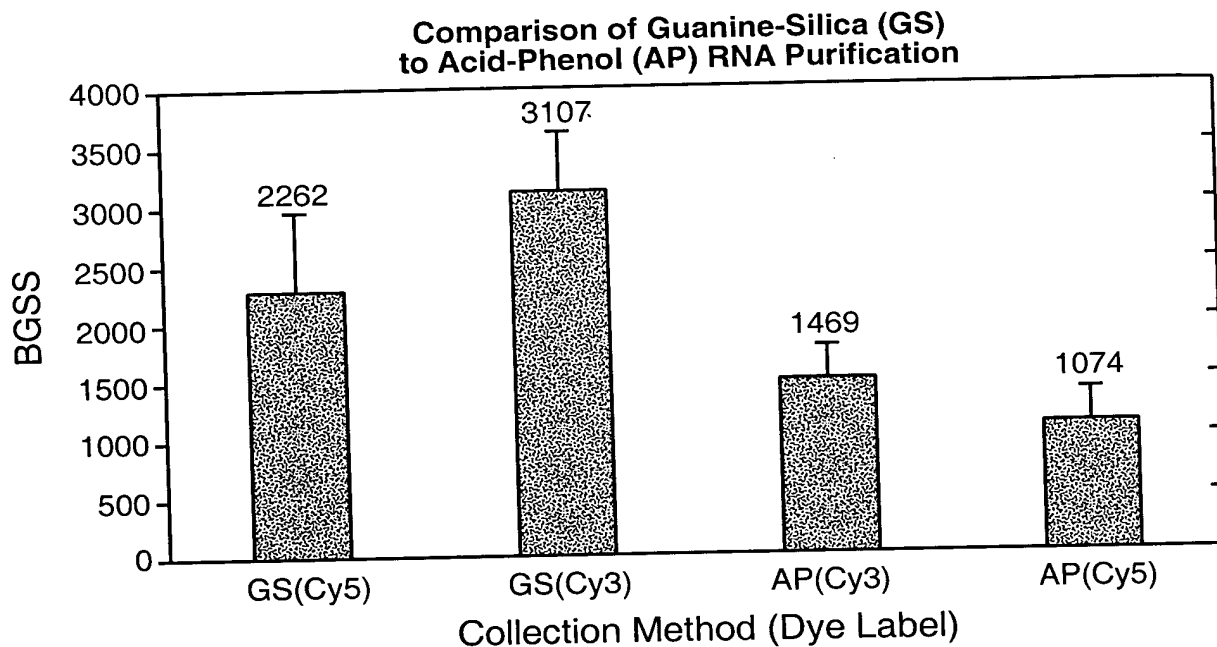10. Password and account number to access central database server.
11. Kit User Manual

FIG._3

**Comparison of Guanine-Silica (GS)
to Acid-Phenol (AP) RNA Purification**

FIG._4

Expression of Leukocyte-Specific Genes

FIG._5

Expression of Leukocyte-Specific Genes

FIG._6

Comparison of Control RNAs

All Columns Use the Same Scale.
— Mononuclear Cells, Resting and Stimulated
— 10 Buffy Coats, Resting
— Mononuclear Cells, Resting
All Markers are Connected and Ordered by Features.
10 µg of Each Control RNA was Labeled.
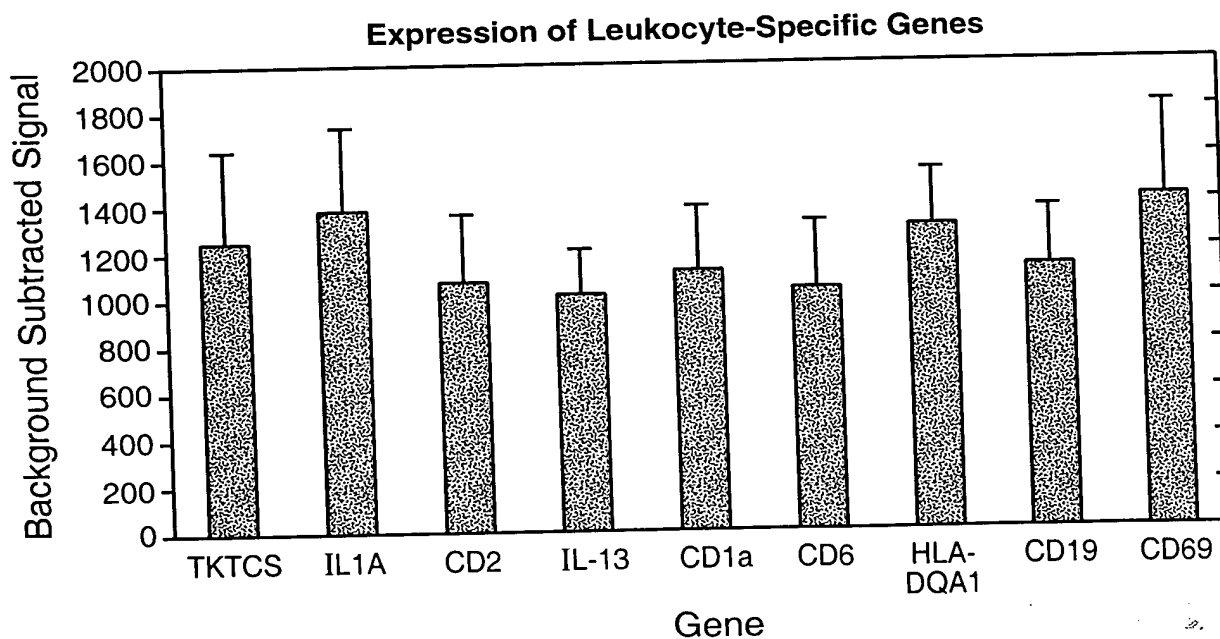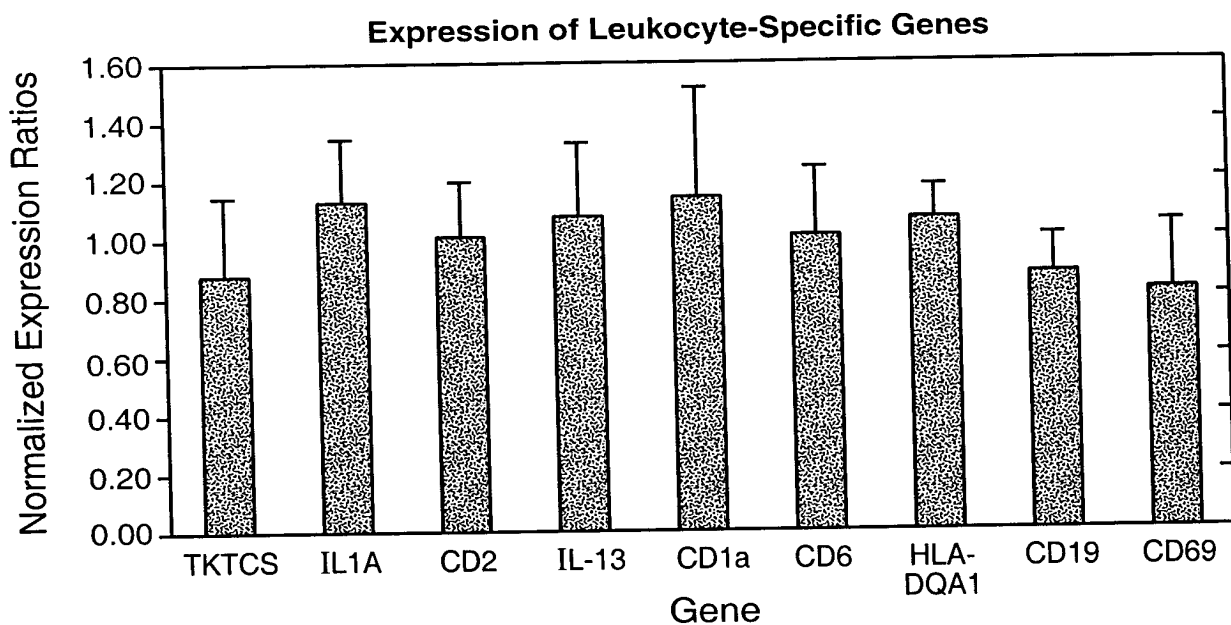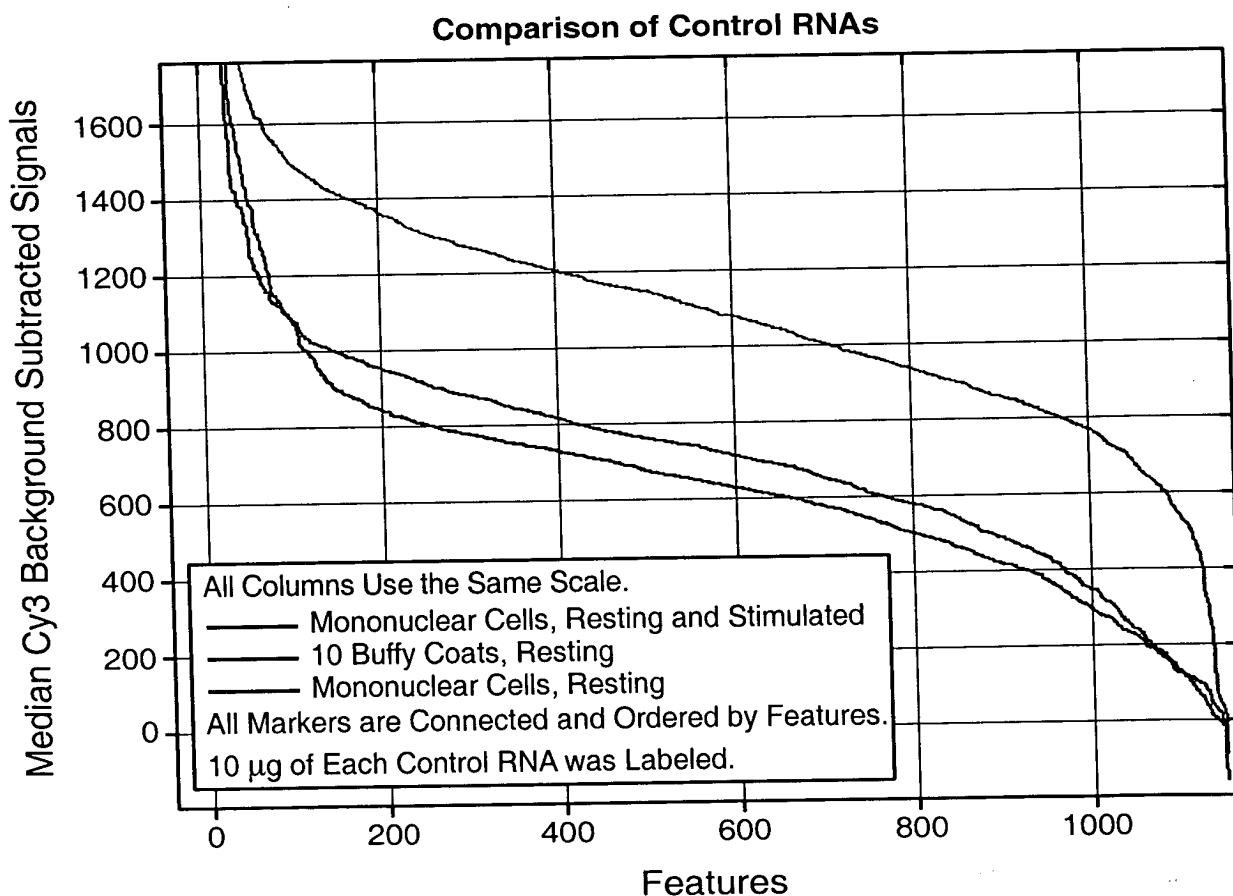
FIG._7

Log Expression of Each Probe Using the R50 Reference RNA. Probe Expression is Ordered by Signal to Noise, S / N, Decreasing from Left to Right.
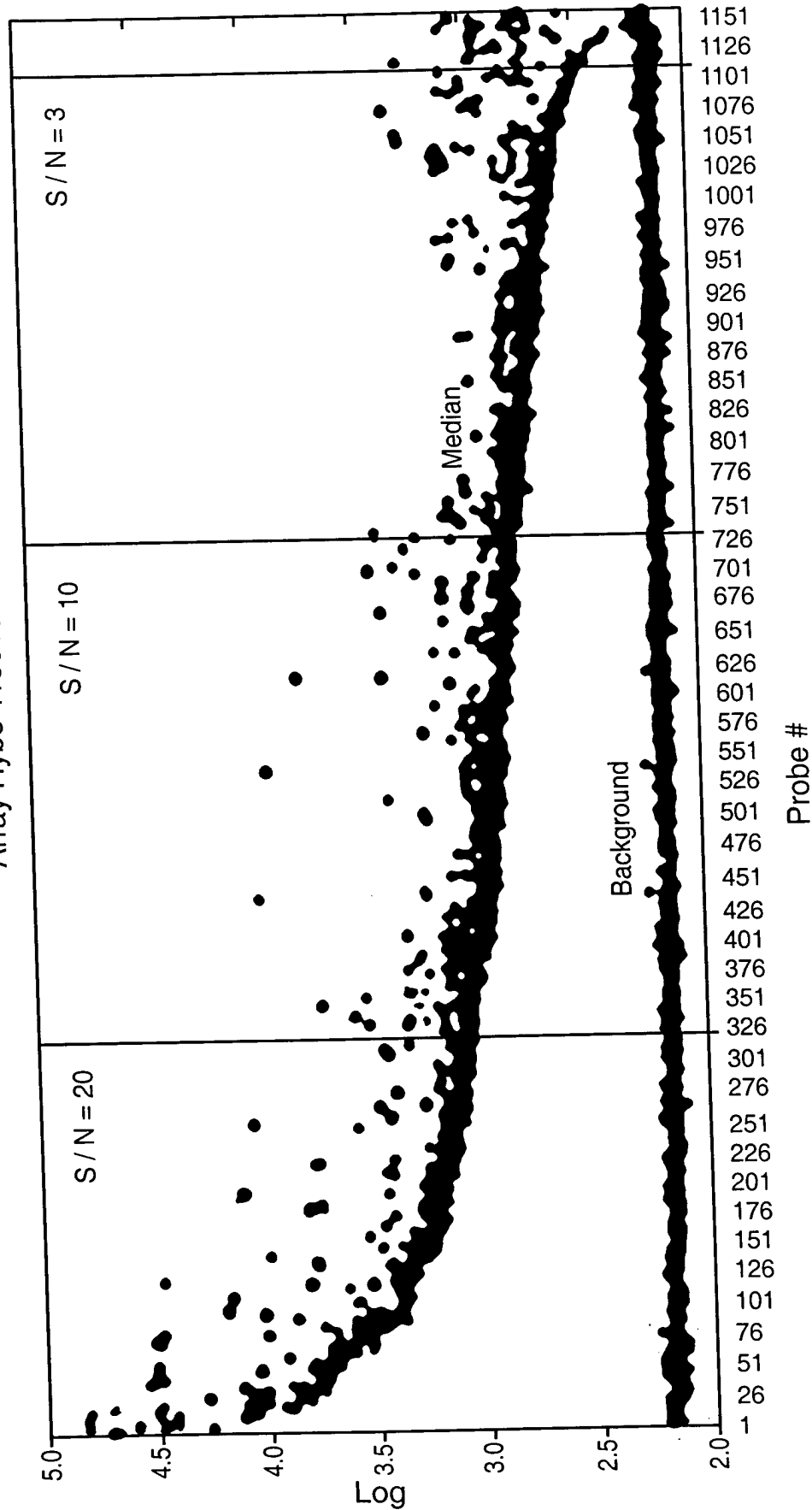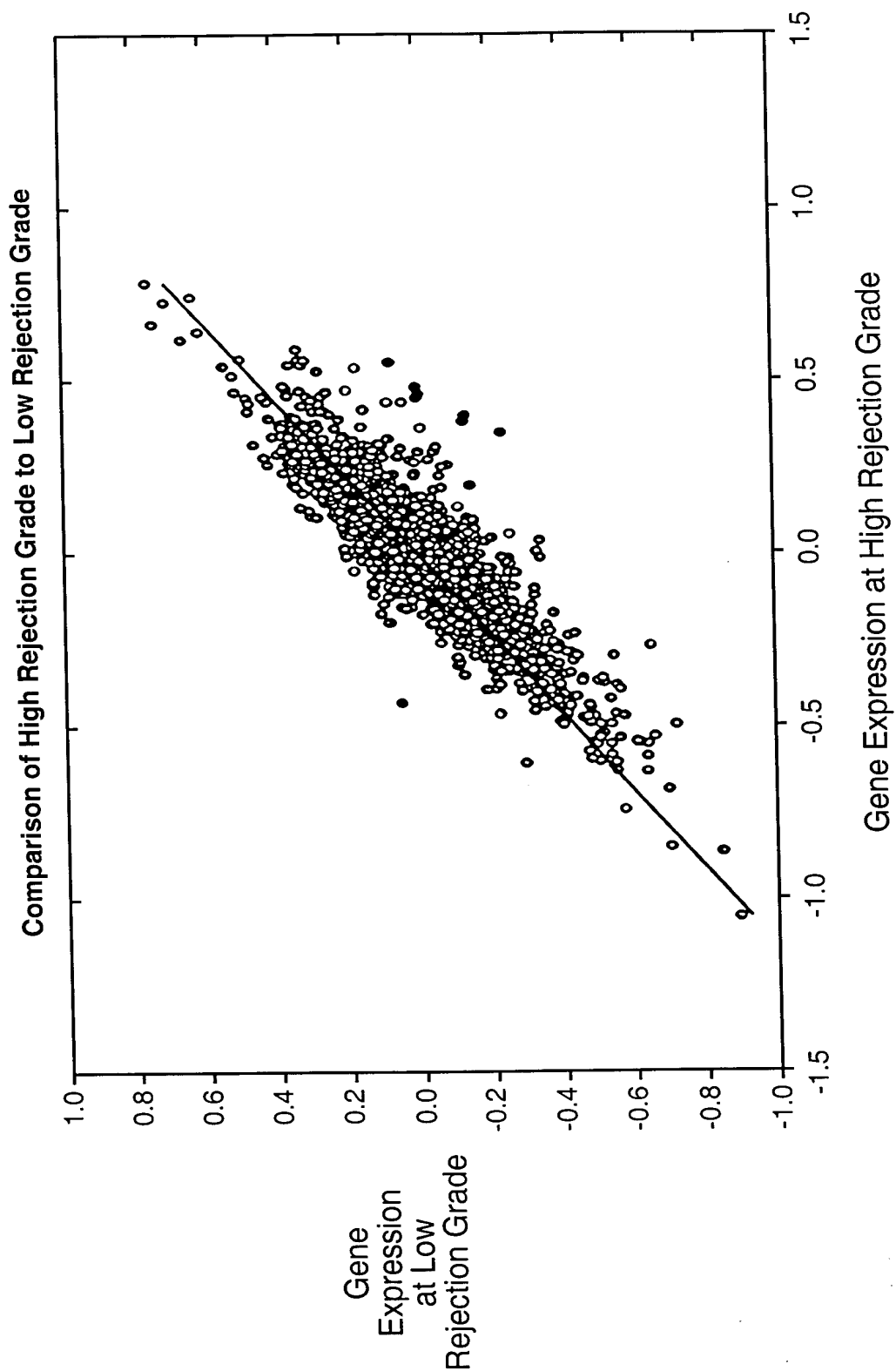
Array Hybe 115018

FIG._8

Comparison of High Rejection Grade to Low Rejection Grade

Gene
Expression
at Low
Rejection Grade

Gene Expression at High Rejection Grade

FIG._9

FIG._10A

Differential Gene Expression Between Grade 0 and 3A Samples:

Acc#	Name	Probe Oligo ID	Array 107742: Grade 0 F633 Median - B633	F532 Median - B532	Cy3 / Cy5 Ratio	SR: Scaled Ratio (g / r)
NM_003202	transcription factor 7 (T-cell specific, HMG-box) (TCF7),	2476	5558	1050	0.188917	0.710038
BE220959	major histocompatibility complex, class II, DQ beta 1 (HL	6025	1810	635	0.350829	1.318579
BE220959	major histocompatibility complex, class II, DQ beta 1 (HL	6025	1402	487	0.347361	1.305545
NM_002922	regulator of G-protein signalling 1 (RGS1), mRNA / cds=	2407	804	95	0.118159	0.444098
NM_001781	CD69 antigen (p60, early T-cell activation antigen) (CD6	2192	4121	405	0.098277	0.369371
NM_002341	lymphotoxin beta (TNF superfamily, member 3) (LTB), tr	2283	13488	3477	0.25556	0.960516
BE220959	major histocompatibility complex, class II, DQ beta 1 (HL	6025	1539	515	0.334633	1.257707
NM_001781	CD69 antigen (p60, early T-cell activation antigen) (CD6	2192	3850	386	0.10026	0.376823
U05040	far upstream element (FUSE) binding protein 1 (FUBP1	3581	4507	1119	0.24828	0.933154
X14008	nuclear receptor subfamily 4, group A, member 2 (NR4A	3729	1365	167	0.122344	0.459827
NM_003202	transcription factor 7 (T-cell specific, HMG-box) (TCF7),	2476	2716	486	0.17894	0.672539
AF035947	cytokine-inducible inhibitor of signaling type 1b mRNA,	642	9850	5254	0.533401	2.004771
NM_001781	CD69 antigen (p60, early T-cell activation antigen) (CD6	2192	3357	356	0.106047	0.398574
Y14737	mRNA for immunoglobulin lambda heavy chain / cds=(65	4905	1390	248	0.178417	0.670576
Y14737	mRNA for immunoglobulin lambda heavy chain / cds=(65	4905	1398	240	0.171674	0.645231
BC006402	mRNA for immunoglobulin lambda heavy chain / cds=(65	4481	1826	295	0.161555	0.6072
X57812	rearranged immunoglobulin lambda light chain mRNA / c	3761	6512	747	0.114711	0.431139
X57812	rearranged immunoglobulin lambda light chain mRNA / c	3761	6728	755	0.112218	0.421766
X72475	cDNA: FLJ21321 fis, clone COL02335, highly similar to	3790	8572	1188	0.138591	0.520889
X72475	cDNA: FLJ21321 fis, clone COL02335, highly similar to	3790	15538	2128	0.136955	0.514739
X72475	cDNA: FLJ21321 fis, clone COL02335, highly similar to	3791	11974	1558	0.130115	0.489034
X57812	rearranged immunoglobulin lambda light chain mRNA / c	3761	6953	778	0.111894	0.420551

FIG._10B

Array 107739: Grade 3A				Ratio of SRs	
F633 Median - B633	F532 Median - B532	Cy3 / Cy5 Ratio	SR: Scaled Ratio (g / r)	Grade 0 / 3A	Grade 3A / 0
5827	358	0.061438	0.219793	3.23048873	0.30955069
2150	252	0.117209	0.419312	3.14462275	0.31800317
2121	247	0.116455	0.416612	3.13371968	0.31910959
1884	75	0.039809	0.142415	3.11833431	0.32068403
7385	254	0.034394	0.123043	3.00195843	0.33311587
29882	2727	0.091259	0.326476	2.94207495	0.33989617
1942	237	0.122039	0.436591	2.88074602	0.3471323
7705	282	0.0366	0.130934	2.87796556	0.34746767
2390	220	0.09205	0.329306	2.83369583	0.35289603
9541	434	0.045488	0.162731	2.82568319	0.35389672
5310	356	0.067043	0.239845	2.80405488	0.3566264
969	197	0.203302	0.727307	2.75642938	0.36278818
5963	246	0.041254	0.147586	2.70062225	0.37028503
6561	5767	0.878982	3.144527	0.21325167	4.68929496
7159	6112	0.853751	3.054262	0.21125576	4.73359863
2973	2498	0.840229	3.005889	0.20200364	4.95040579
27381	17730	0.647529	2.316513	0.18611538	5.37301111
28820	18636	0.646634	2.313311	0.18232143	5.48481867
17322	13892	0.801986	2.869076	0.18155283	5.50803866
17637	14245	0.807677	2.889436	0.17814525	5.61339689
24261	18761	0.773299	2.766449	0.17677319	5.65696646
27621	18560	0.671952	2.403886	0.1749461	5.71604612

X72475	cDNA: FLJ21321 fis, clone COL02335, highly similar to	3791	10805	1411	0.130588	0.49081
X72475	cDNA: FLJ21321 fis, clone COL02335, highly similar to	3790	11246	1453	0.129201	0.4856
AF067420	SNC73 protein (SNC73) mRNA, complete cds / cds=(39	4399	2654	243	0.09156	0.344125
X72475	cDNA: FLJ21321 fis, clone COL02335, highly similar to	3791	10909	1370	0.125584	0.472005
AF067420	SNC73 protein (SNC73) mRNA, complete cds / cds=(39	4399	1959	181	0.092394	0.34726
AF067420	SNC73 protein (SNC73) mRNA, complete cds / cds=(39	4399	2558	215	0.08405	0.315899
BC002963	rearranged immunoglobulin mRNA for mu heavy chain e	4474	7538	684	0.09074	0.341044
BC002963	rearranged immunoglobulin mRNA for mu heavy chain e	4474	8662	780	0.090048	0.338444
BC002963	rearranged immunoglobulin mRNA for mu heavy chain e	4474	7183	608	0.084644	0.318133
BC002963	rearranged immunoglobulin mRNA for mu heavy chain e	4475	8986	851	0.094703	0.355938
BC002963	rearranged immunoglobulin mRNA for mu heavy chain e	4476	11118	1023	0.092013	0.345828
BC002963	rearranged immunoglobulin mRNA for mu heavy chain e	4475	7428	730	0.098277	0.36937
BC002963	rearranged immunoglobulin mRNA for mu heavy chain e	4476	10413	933	0.0896	0.336757
BC002963	rearranged immunoglobulin mRNA for mu heavy chain e	4475	5841	484	0.082863	0.311436
AF067420	SNC73 protein (SNC73) mRNA, complete cds / cds=(39	4398	7960	645	0.08103	0.304549
AF067420	SNC73 protein (SNC73) mRNA, complete cds / cds=(39	4398	11959	992	0.08295	0.311765
AF067420	SNC73 protein (SNC73) mRNA, complete cds / cds=(39	4398	6161	447	0.072553	0.272689

FIG._10C

17533	0.817544	2.924735	5.95900079
17074	0.811936	2.904673	5.9816215
37518	0.57599	2.060585	5.98789603
21668	0.856609	3.064488	6.4924922
30274	0.63979	2.288826	6.591109804
36161	0.60662	2.170163	6.86979225
6038	0.668599	2.391889	7.01342553
4339	0.685642	2.45286	7.24745312
5521	0.708024	2.532931	7.96186351
1587	0.803403	2.874145	8.0748531
871	0.783008	2.801184	8.09993947
1049	0.848427	3.035218	8.21727973
625	0.7776	2.781837	8.2606647
1694	0.793388	2.838319	9.11364747
22985	0.813313	2.909599	9.55378803
14170	0.888991	3.180333	10.2010527
16180	0.874413	3.128181	11.4716196

14334	0.16781337
13863	0.16717875
21610	0.16700357
18561	0.15402406
19369	0.15171979
21936	0.14556481
4037	0.14258368
2975	0.13797951
3909	0.12559874
1275	0.12384126
682	0.12345771
890	0.12169477
486	0.12105563
1344	0.10972555
18694	0.10467052
12597	0.0980291
14148	0.08717165

FIG._10D

FIG._10D

FIG._10A	FIG._10B
FIG._10C	FIG._10D

FIG._10